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RESEARCH DEVELOPMENTS

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Second Languages and Australian Schooling

Promoting mental
health in schools

Assessing
science learning

Bringing schools and
funds together

Informing
mathematics
pedagogy



Professor Geoff Masters
Chief Executive Officer

'Evidence-Based' Education

Classroom teachers, school leaders, system leaders and education policy makers all benefit from dependable and accurate information about the challenges they face, as well as reliable evidence about effective interventions and practices.

Too often in education, decisions and actions have not been preceded and informed by careful analyses of the prevailing situation. Too often, we have assumed that we know what we are dealing with. For example, we often have inferred students' needs from the groups to which they belong, teaching children the Year 1 curriculum because they were in Year 1 (rather than establishing what individuals were actually ready to learn) and allowing our expectations of other students to be lowered by their socioeconomic backgrounds, Indigenous status or gender. Outstanding schools and school systems recognise the pitfalls in prejudging learners and place a high priority on identifying actual student capabilities and needs.

In this edition of *Research Developments* Dr Sue Thomson reports on ACER work to identify areas of mathematics learning in which Australian Year 4 and Year 8 students perform particularly poorly or particularly well. In a separate article, I describe a newly developed resource (PAT Science) to assist teachers in their assessment, diagnosis and monitoring of students' science learning between Year 3 and Year 10. These are two examples of current ACER work to provide schools, school systems and teachers with reliable, accurate information about actual student achievements.

Improved outcomes also depend on deep professional knowledge about effective interventions. Again, many programs and initiatives in education have been driven more by fads and beliefs about what should work than by solid research evidence. Suzanne Mellor's article outlines research findings concerning the personal and educational benefits of second language learning in schools. Dr Catherine Scott describes work to incorporate into a PD resource for secondary teachers research findings concerning the link between mental health and student learning. Both articles illustrate current ACER contributions to ensuring that educational policy and practice are informed by quality research evidence.

A handwritten signature in blue ink that reads "Geoff Masters". The signature is written in a cursive, flowing style.

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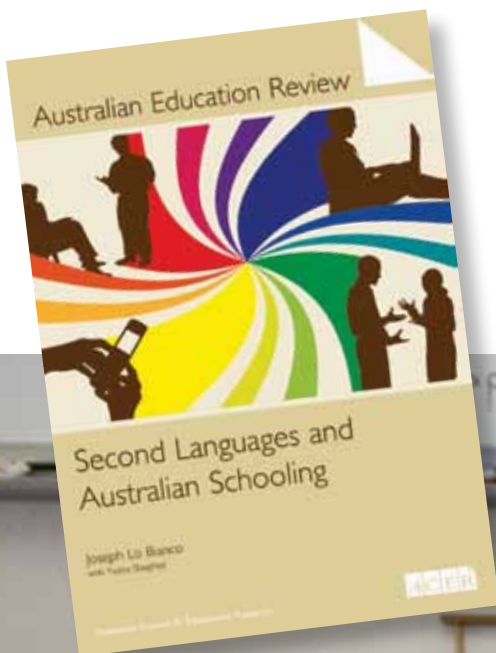
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Second languages and Australian schooling



There are good reasons for all Australian children to study a second language from an early age according to the latest Australian Education Review.

Suzanne Mellor explains why.





Suzanne Mellor is a Senior Research Fellow with ACER and series editor of the Australian Education Review (AER)

Second language education is a subject of continual public debate in Australia. While there is widespread recognition that the cultivation of bilingual skills among young Australians serves intellectual, cultural and economic needs, this recognition is not reflected in the uptake of second language courses. Second language learning in Australia is dogged by low school completion rates, high rates of attrition from university language programs and a decline in the number of languages taught, their duration, spread and level of seriousness. Of particular concern is the knowledge that by the time they reach senior secondary school almost 90 per cent (89.7%) of students have decided that languages are not for them.

The parlous state of second language learning in Australia is examined in detail in the latest edition of ACER's Australian Education Review (AER) authored by University of Melbourne Professor of Languages Joseph Lo Bianco. In *Second Languages and Australian Schooling* (AER number 54),

Professor Lo Bianco traces the history of language learning in Australia, outlines the findings of research from Australia and overseas and proposes a new rationale for language learning policy.

The review provides evidence that students who choose not to study a second language or, through the unavailability of language studies in their school, can't study a second language are sadly missing out on significant educational and personal benefits. In the foreword to the review Professor Richard Johnstone from the University of Stirling writes 'A life lived monolingually misses out on something that is essentially human.' These sentiments echo throughout the review as it argues that the case for increased second language learning in Australia is far better grounded in the personal benefits to individual learners than in arguments about economic and social benefits.

The review makes a very strong case for the studying of a second language by all Australian students from an early



age. Professor Lo Bianco's summary of Australian and international research helps us to reach the conclusion that there are significant demonstrated educational benefits from studying a second language from the early years of schooling. Many are specified in the review and relate to children's meta-linguistic awareness, enhanced literacy and other improvements in general cognitive functioning. The research examined provides particular support for second language immersion programs. Professor Lo Bianco writes:

In broad terms the research concludes that immersion methodology is a valid, effective and durable mode for second language learning as well as for imparting the general curriculum to young learners, while supporting their English development. Although the number of studies on immersion education is vast the results do not vary greatly.

Even limited contact with a second language can be beneficial. For example, a study of Grade Prep and Year 1 students at a Melbourne primary school who were exposed to just one hour of Italian instruction per week found that the language lessons had

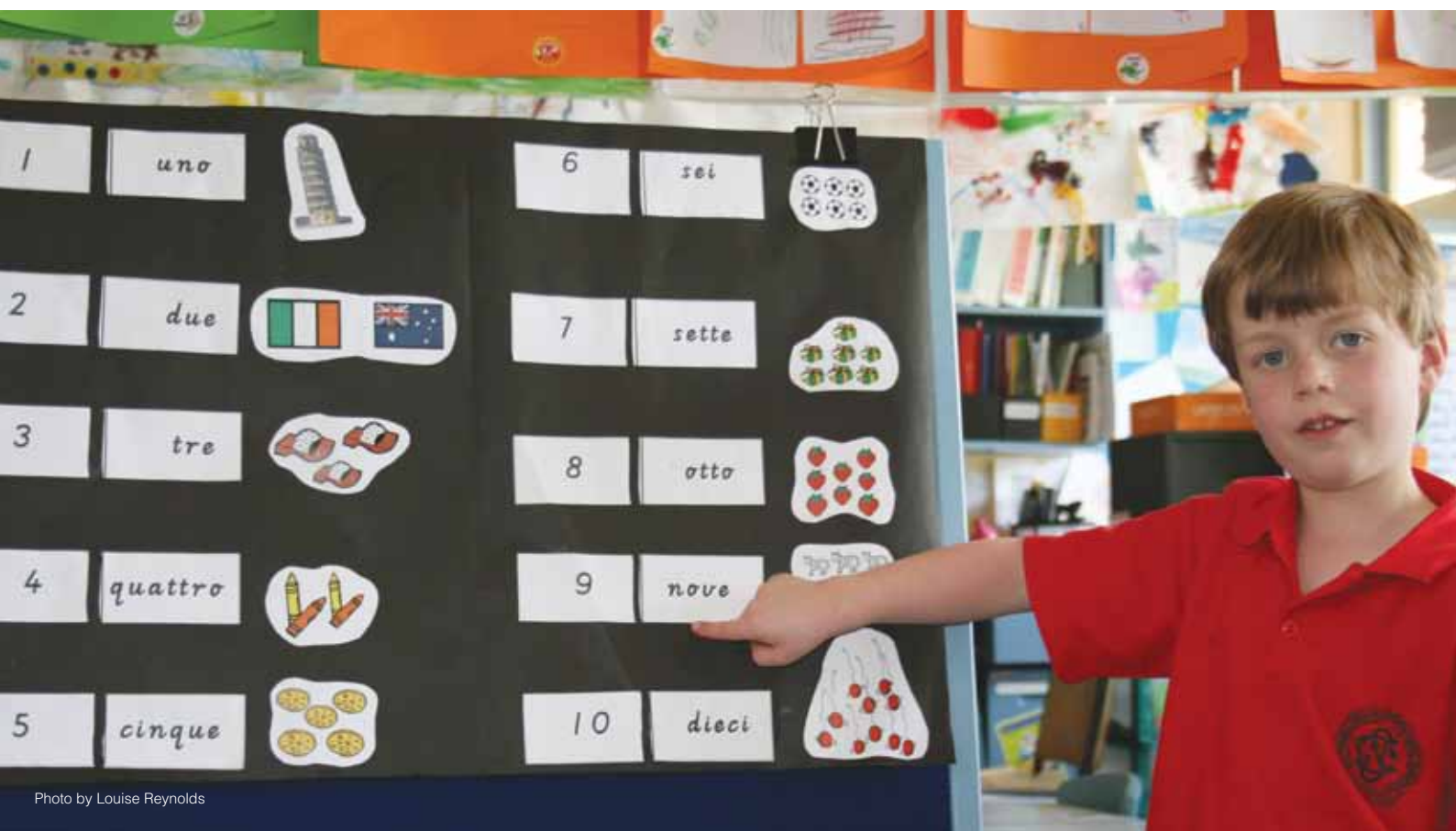
a positive effect on the children's word awareness in English. This suggests that learning a second language can support and illuminate knowledge of a child's first language.

If evidence of the benefits of second language learning is quite clear, why is it that such a vast majority of Australian students still do not study a language to the end of their schooling? Professor Lo Bianco attributes this to a number of factors including a perception that second languages are difficult to learn. Another hindrance to the uptake of second language study is the role of English as the *lingua franca* of the world today. The dominance of English may dissuade native English speakers from studying a second language because they think they can travel and work in foreign lands using English. But as Professor Lo Bianco reminds us 'to buy one doesn't need to know other languages, but to sell, well that's a different story'.

Changing political and economic priorities over the past few decades has seen particular languages come in and out of favour. In the 1950s and 1960s learning a second language was seen as an elitist pursuit for those who desired careers in the diplomatic

service. The implementation of multicultural policies in the 1970s saw an emphasis on learning community languages including Italian and Greek. Since the 1990s a renewed focus on political and economic ties with Asia led to growing demand for Australians to learn languages such as Japanese, Chinese and Indonesian. The changing policy directions and arguments about which groups of languages should be favoured have had a negative impact on second language study in our country. As Professor Lo Bianco writes 'It is an unfortunate aspect of past policy that utilitarian rationales, and the often crisis-driven pressure to establish programs quickly, have resulted in a proliferation of rather superficial second language teaching endeavours.'

In addition, the promotion of language study by successive governments as being related to labour market and economic issues has not worked. Signals have sometimes been sent to students that future employment prospects will be enhanced by, or even dependent on, their ability to speak the language of one of our key trading partners or political allies. But, as enrolment figures prove, this message has failed to convince students, their



schools and parents that the learning of a second language is worthwhile.

According to Professor Lo Bianco, arguments about which languages students should study must be replaced with a new educational rationale for learning languages with the aim of making languages 'a compulsory, unproblematic and celebrated part of the education of all Australian children.' He proposes a strategy to reinvigorate second language learning in Australian schools that has four components: cultivating existing language competencies, learning how to learn languages, articulated learning, and teaching of languages and language training for commercial purposes.

A central argument is for a major improvement in the quality of language teaching across the nation. Professor Lo Bianco argues that, while the single most important variable in second language education is the quality of language teachers, at times the quality of language teaching in Australia has been too low. Teacher preparation must be a priority focus for any second languages learning policy because 'only with a continuing supply of high-quality teachers, and articulated delivery at school and district levels, will it be possible to secure continuation for many students in formal language study in their selected languages.'

Professor Lo Bianco identifies seven Asian and European languages – Chinese (Mandarin), French, German, Indonesian, Italian, Japanese and Spanish – that students should have 'an entitlement to continuation' allowing them to continue studies throughout their schooling and proposes support systems for a wider range of languages. He concludes with a reminder about why the learning of second languages should be regarded as a high priority in the education of Australian children:

All students should experience well-designed and supported language programs, taught

by well-trained and supported language teachers, in schools that actively support language teaching linked to universities that are fully committed to widespread and successful language study. It is worth reiterating why this ambition is important. The principal reason is to do with the deepest purposes of education itself, to instill knowledge, to deepen understanding, to stimulate reflection and to foster skills. Languages are intimately linked to the essentially humanistic, cultural and intellectual reasons for making education compulsory...Every effort to redress the persisting underperformance in language education is amply justified.

Further information

Professor Joseph Lo Bianco is Professor of Language and Literacy Education at the University of Melbourne. He has numerous publications in language education and has contributed to Australian language policy for many years. He is currently undertaking research on the identity effects of mass English teaching in China, language policy in Thailand, bilingual education in Sri Lanka, Australian Indigenous languages and the newly emergent teaching method of Content and Language Integrated Learning.

The Australian Education Review (AER) series provides literature reviews, with analyses, of contemporary issues in education. The first in the revamped AER series was published in February 2004.

Australian Education Review number 54, *Second languages and Australian schooling*, by Joseph Lo Bianco with Yvette Slaughter, is available for download from the ACER website at <www.acer.edu.au/aer> Print copies can be purchased from ACER Press. Visit <<http://shop.acer.edu.au/acer-shop/group/AER>> or contact customer service on 1800 338 402 or via email to sales@acer.edu.au ■



Touching the Future: Building skills for life and work **Australian Education Review Number 55**

By Johanna Wyn

AER 55 explores the goals of Australian education and of how schools should prepare young people for work and life.

Touching the Future: Building skills for life and work explores:

- what young people need to learn and why
- the nature of broad social and economic changes over the last 20 years
- assumptions of current educational policies about aligning school to economic goals and the nature of work
- policy frameworks for social inclusion, civic education, life skills and well-being
- practices of social exclusion of people with rural, Indigenous and low socioeconomic backgrounds
- curriculum development that equips young Australians for work and life
- the nature of school knowledge and questions the outcomes traditionally measured.

AER 55 concludes that meeting the goals of Australian education for the future will necessitate a commitment to learning for both work and life.

Johanna Wyn is Director of the University of Melbourne's Youth Research Centre.



Photo by Cathy Yeuler/Stockxpert

Promoting mental health in schools



Catherine Scott is a Senior Research Fellow in ACER's Teaching, Learning and Leadership research program

MindMatters is a national mental health initiative for secondary schools funded by the Australian Government Department of Health and Ageing and implemented by Principals Australia. MindMatters uses a whole school approach to mental health promotion based on the principles of the World Health Organization's Global School Health Initiative and the Australian National Health Promoting Schools Framework.

MindMatters aims to:

- embed promotion, prevention and early intervention activities for mental health and wellbeing in Australian secondary schools
- enhance the development of school environments where young people feel safe, valued, engaged and purposeful
- develop the social and emotional skills required to meet life's challenges
- help school communities create a climate of positive mental health and wellbeing

- develop strategies to enable a continuum of support for students with additional needs in relation to mental health and wellbeing, and
- enable schools to better collaborate with families and the health sector.

The whole school approach

MindMatters believes that every person who is part of a school community is a teacher for mental health and wellbeing. The actions and behaviours of all school personnel can make a positive contribution.

A whole school approach to mental health and wellbeing ensures that social and emotional learning and mental health are part of every classroom teaching and learning program. Effective classroom practice is essential to promote and protect the mental health and wellbeing of students.

Professional development

MindMatters offers professional development that explains and



ACER is supporting mental health initiatives in secondary schools by assisting with the preparation of a professional development booklet for the MindMatters program as **Catherine Scott** explains.

explores the implementation of the whole school approach to mental health promotion, prevention and early intervention.

Over 18 months to three years, schools can become recognised as MindMatters schools. This involves two-day introductory workshops and planning workshops, followed by more detailed focus modules. The following focus modules are available as part of the MindMatters professional development program: leadership, staff matters, student empowerment, communities do matter, students experiencing high support needs in mental health, the whole student approach, teaching and learning for engagement, measuring progress and transitions.

Teaching and learning for engagement focus module

ACER staff are contributing to the production of the teaching and learning for engagement focus module. This module highlights the link between mental health and student

learning outcomes. It explores a range of methodologies designed to create positive relationships and safe environments to engage students in learning.

Teachers and curriculum learning area leaders will plan mental health curriculum content and pedagogy that expresses the MindMatters whole-school approach to mental health and wellbeing. Adolescent brain development, current pedagogies and reflective practices for teachers will also be examined.

The teaching and learning for engagement module covers areas such as beginning teaching, teaching social and emotional learning and changes in the role of teachers, teacher leadership, professional judgement, measuring good teaching and learning, reflective practice and teaching as a career.

As an example, the section about beginning teaching discusses how the majority of people who decide to become teachers do so for mainly

altruistic reasons. Teachers' work in response to these motivations needs to be nurtured and supported, especially when teachers are at the earliest stages of their profession. However, research has identified that the main issues that concern beginning teachers include lack of preparation for the realities of the classroom, high workloads, excessive paperwork, class sizes, bureaucratic demands and lack of peer/mentor support. Beginning teachers require support for, not impediments to, their deeply felt intrinsic desire to help young people learn. Continuing neglect of these issues is proving costly in terms of money wasted in high teacher attrition rates, but nobody really knows how costly it is in terms of preventable damage to the mental health of teachers and students, and the consequent failure of many students to learn.

Further information about the MindMatters program is available from www.mindmatters.edu.au ■



Assessing science learning

A new school assessment resource provides teachers with information about individual students' achievement and progress in science.

Geoff Masters details the development of the Progressive Achievement Test in Science.



Geoff Masters is ACER's Chief Executive Officer

The most recent international tests of scientific literacy have shown that Australian students perform above the international average – yet many students make little overall progress in science across the years of schooling.

Less than 10 per cent of Australian students achieve an 'advanced' standard in science, while 13 per cent of Australian students are classified as 'at risk' of not having the basic levels of scientific understanding required to function in adult society, according to international tests of scientific literacy such as the Trends in International Mathematics and Science Study (TIMSS) for 2007 and the Organisation for Economic Cooperation and Development's Programme for International Student Assessment (PISA) for 2006.

TIMSS and PISA also reveal that many of our primary teachers report feeling unprepared to teach primary science; and, as in some other countries, there's been a decline over several decades in the percentage of senior secondary and university students choosing to study science at an advanced level.

While tests such as TIMSS and PISA can provide information on Australia's relative performance in science and are useful to inform educational policy, there is an identified need for better classroom information about the progress students make in their science learning between Year 3 and Year 10.

Improved levels of science achievement in Australian schools are likely to depend, in part, on greater



national clarity about what students are expected to learn in each year of school, better data on how well these expectations are being met and an improved basis for tracking individual science learning over time. Most existing classroom assessment resources do not describe students' science knowledge with any precision and do not quantify improvements in science learning over time.

A new school assessment resource in science from the Australian Council for Educational Research (ACER) has been introduced to fill this gap.

The launch of the *Progressive Achievement Tests in Science*, or PAT Science, follows more than two years of development and trial testing. PAT Science is a new addition to the Progressive Achievement Tests series, and complements PAT Reading and PAT Maths, which are widely used in Australian schools.

PAT Science follows the model of PAT Reading, PAT Maths and the National Assessment Program – Literacy and Numeracy, or NAPLAN, tests in that it consists of a series of increasingly difficult tests that can be used to monitor student learning. There are eight science tests of increasing difficulty for use in Years 3 to 10. The tests have no common items. Each test is appropriate for, and normed on, two or three year levels. Tests 1 to 4 are 30-minute tests; tests 5 to 8 are 40-minute tests.

The PAT Science tests have been developed to address a curriculum framework constructed from a detailed analysis of the science frameworks of all Australian states and territories. The PAT Science manual shows how each item on the tests maps to the science framework in each state and territory. The first edition of PAT Science predates the introduction of the national science curriculum, but has been informed and influenced by the National Curriculum Board's 2008 *National Science Curriculum Framing Paper*.

Although existing state and territory frameworks describe areas of science knowledge and knowledge about the processes of science in slightly different ways, there is a high degree of consistency across these frameworks which generally identify four broad areas of science learning. These can be summarised as: physical systems, for example, energy and change; chemical systems, for example, materials; geological and space systems, for example earth and space; and living systems, for example, life and living. The processes of science, which include knowledge about the culture of science and its impact on society, form a fifth area, for example, investigation.

Teachers are provided with two kinds of questions: multiple-choice and short-answer. Only multiple-choice questions are used in calculating students' PAT Science scores. Short-answer questions are provided for each test to illustrate how written responses can be used by teachers to explore students' understandings of scientific phenomena. Responses to multiple-choice questions can either be hand scored in schools or forwarded for computer scoring through ACER's test scoring service.

ACER has developed a number of PAT Science report forms to assist teachers and schools in their interpretation of students' test results. A diagnostic report outlines 10 described levels of achievement specifying what students at each level on the PAT Science scale typically know and are able to do. This report is likely to be particularly useful in making decisions about the best ways to target teaching on student needs, in describing the learning outcomes students have achieved and in reporting learning progress over time. This report also provides details of students' performances on individual test questions.

Norm tables have been developed to allow teachers and schools to compare students' test results with the performances of other students

in the same year level. In November 2008, trial PAT Science tests were administered to a nationally representative sample of more than 7000 Year 3 to Year 10 students in 86 schools in all states and territories and across all school sectors. The performances of these students were used in the construction of the norm tables.

For each student taking one of the science tests, schools are provided with:

- the student's score on the PAT Science scale, indicating the student's current level of science achievement and providing a basis for monitoring that student's progress over time using subsequent tests in the series
- an indication of how the student's score compares nationally with the performances of other students in the same year level – in the form of a percentile rank or stanine score
- a description of the kinds of science knowledge and skills typical of students at that level of achievement on the PAT Science scale, and
- a summary of how the student performed across different areas of scientific literacy, indicating areas of relative strength and weakness.

By providing this information, PAT Science gives schools the opportunity to offer parents more objective reports of student progress and achievement in science.

PAT Science reports science achievements on a scale that can be used to track progress from Year 3 to Year 10, and describes the knowledge, skills and understandings typical of students at varying levels along this scale. It is unique in offering teachers and schools an unparalleled resource for establishing current levels of science achievement and for monitoring student learning and school performance in this key area of the curriculum. ■

Bringing schools and funds together



The Tender Bridge has been developed by ACER to help schools find relevant learning-related funds.

Michelle Anderson describes this new service.



Michelle Anderson is a Senior Research Fellow in ACER's Teaching, Learning and Leadership research program

School leaders have told ACER that they need access to comprehensive, easy-to-understand, education-specific information on what funding is available and how to apply for it. Funders have told ACER that they are looking for applicants who are a good fit with their values and priorities, and who meet their stated eligibility requirements.

The Tender Bridge is a new national service to help bring schools and learning-related funds together more effectively.

Research in schools around Australia revealed that many educators did not have the time, knowledge or skills to effectively search for, apply for, implement, and report on accountabilities around funding for special projects in their schools.

Many educators had great ideas for improving the learning conditions for students but they had less knowledge

in how to fund an idea, where to look to identify suitable funding options and what was required to secure and use the funds effectively.

The Tender Bridge is a comprehensive, searchable database of different funding opportunities that schools, or schools in partnership with others, are eligible to apply for. The database spans philanthropic, business, and federal, state and local council funding sources.

The database is tailored specifically to the needs of schools and other educational providers. Subscribers to the Tender Bridge have a single point of access to information and resources about a wide range of funding opportunities for schools or schools in partnership with others.

In 2008, I conducted a scoping study to ascertain whether there really was a need for education specific services in this area. People were asked about



Photo by Monika Wisniewska/Shutterstock.com

their current practices in this area and what they perceived were key barriers to seeking and using additional funding opportunities.

Amongst its findings, the scoping study identified that:

1. More funds could be going into more schools. Additional funding opportunities are out there, but for various reasons, such as time and capacity, school leaders' approaches to seeking and using funds are at best patchy.
2. Not all funding information is relevant to schools or educational in focus.
3. No organisation currently tailors all the possible grant information for schools or schools in partnership with others.
4. Two key disincentives for school leaders are the time it takes to identify funding options; and

seeking and weighing up whether it is worth putting in for a grant.

5. School leaders take into account various factors when deciding whether to put in for a fund. These include the stress involved; the total grant amount versus the number of words to be written for a submission; relevance to school priorities; and who will actually do the work.

The principle underpinning the development of the Tender Bridge is the importance of bringing schools and funds together. The Tender Bridge aims to allow any school leader to have more equitable opportunities to find and apply for funds, not just those who already have the skills, knowledge, resources and networks.

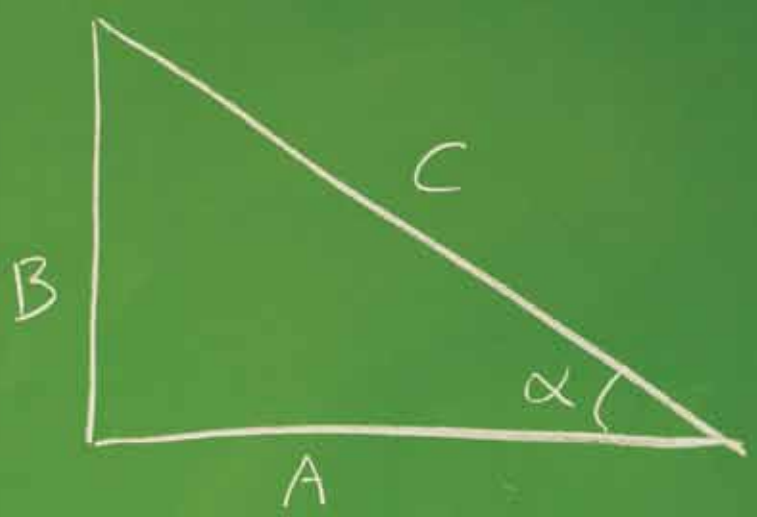
Schools are in the best position to know the needs of their students and their community, and the Tender Bridge makes it easier for school leaders to find funds to match the values and

priorities of the school and the future direction it wishes to take.

In addition to the funding database, the Tender Bridge service includes a range of different learning materials to assist subscribers to improve their knowledge and skills in areas such as philanthropic funding eligibility requirements, writing for successful grant seeking and research into the role of corporate and philanthropic sectors in school education.

The Tender Bridge will also run a series of one-day workshops on developing plans and preparing funding submissions, understanding eligibility requirements, and forging partnerships with other organisations. The workshops will commence in February 2010 and run in several states.

For more information or to subscribe, visit
<<http://tenderbridge.acer.edu.au>> ■



$$A = C \cdot \sin \alpha$$

$$B = C \cdot \cos \alpha$$



Informing mathematics pedagogy

Results from the most recent Trends in International Mathematics and Science Study can inform teaching methods in the classroom, says **Sue Thomson**.



Sue Thomson is a Principal Research Fellow in ACER's National and International Surveys research program and the National Research Coordinator for TIMSS

A new analysis of a selection of mathematics items from the 2007 Trends in International Mathematics and Science Study (TIMSS 2007) has illustrated areas of strength and, particularly weaknesses, for Australian students.

TIMSS 2007 was the fourth in a cycle of internationally comparative assessments, conducted by the International Association for the Evaluation of Educational Achievement (IEA), dedicated to improving teaching and learning in mathematics and science for students around the world.

Carried out every four years with Year 4 and Year 8 students, TIMSS provides data about national and international trends in mathematics and science achievement. It provides a level of international benchmarking to complement national assessments at Years 3, 5, 7 and 9 and other sample-based national studies.

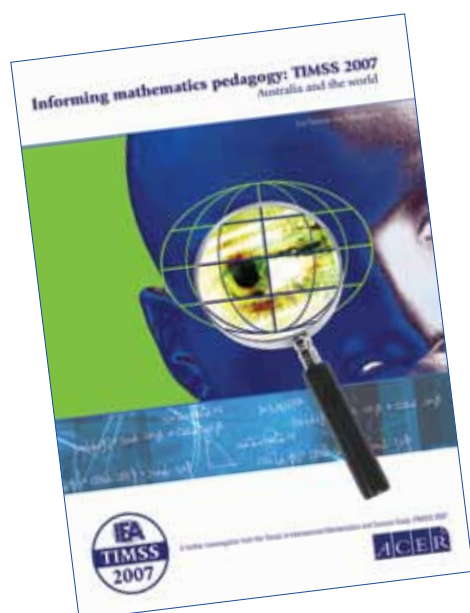
The main Australian national report, *TIMSS 2007: Taking a closer look at mathematics and science in Australia*, released in December last year, provided a 'big picture' view of Australian Year 4 and 8 students' achievement in mathematics and science. It found that Australian Year 4 students displayed some improvement in mathematics achievement since

2003 but achievement levels of Australian students remained static in Year 8 mathematics.

This new report, *Informing mathematics pedagogy: TIMSS 07 Australia and the world*, aims to provide teachers with more detailed information on what Australian students are actually able to do in mathematics in terms of the TIMSS assessment. The report discusses a selection of items from the publicly available questions of the TIMSS 2007 assessment.

The main purpose of this report is to present TIMSS 2007 results in a way that can inform pedagogy. The report explores students' responses to a selection of questions and then considers what these responses might indicate about students' level of understanding for a particular question and its content area. It breaks down responses to individual questions to allow teachers to ascertain whether the mistakes typically made by students in the sample are also mistakes made by their own students. This 'micro' perspective of student achievement may help teachers identify and address areas of weakness in their classes.

To place students' responses in a wider context, the item breakdown presented in this report for Australian students



was compared with the responses from two other countries for international comparison. The first was Chinese-Taipei, which consistently performed in the top three of the 36 countries at Year 4, and the 49 countries at Year 8. Comparison with these students' responses provided an 'upper benchmark' for Australian students. The second country chosen was the United States as the two countries are often compared to one another because of curriculum and general cultural similarities.

Students' responses to five mathematics items at each year level are explored.

Where a multiple-choice question was answered incorrectly it has been possible to determine which incorrect answer (or distracter) was chosen and why this may have been.

For example one Year 4 question asked students to calculate the area of a fence being painted. Forty two per cent of Australian students selected an incorrect answer to this question that suggested they had added rather than multiplied the width and length of the fence.

Another example indicated Australian Year 4 students had not mastered the ability to multiply two-digit numbers together, whereas half of US students and a majority of Chinese-Taipei students had.

While it is difficult to identify trends based on a small sample of items there were also some central themes that emerged through the item analysis conducted. The Year 4 mathematics items reviewed students' skills in number, geometry and data. Australian students performed well on the item assessing their understanding of shapes but their achievement was poorer for other areas, especially in terms related to multiplication, fractions and area.

For Year 8 mathematics, the five items investigated students' understanding of algebra, number, geometry and data. Items assessing algebra revealed a particular area of weakness for Australian students as did a data question that contained components of probability and fractions.

One Year 8 mathematics question, for example, required students to collect like terms in an algebraic expression. Results suggested that only half of the Australian students understood this concept. In contrast, 90 per cent of Chinese-Tapei students answered the question correctly.

Another question tested students' knowledge of data and chance. The question told students how many beads were in a bowl and the probability that a random bead would be blue, and asked them then to choose how many blue beads must then be in the bowl, testing students' understanding of probability and equivalent fractions. While only 45 per cent of Australian students answered this correctly, this is perhaps not too disappointing a result, given that teachers of only 35 per cent of Australian students reported that they had covered the topic of problem solving via the use of probabilistic outcomes.

For some of the items discussed the percentage of answers omitted was quite large. Avoidance of these items is an issue of concern whether it was due to poor competence beliefs or lack of effort. Lastly, larger gender differences for the rate of correct responses tended to favour boys. This trend meets with the general TIMSS 2007 finding that boys outperformed girls in mathematics.

On the most part, the international comparisons made between Australia, the US and Chinese-Taipei served to highlight areas of weakness for Australian students. There

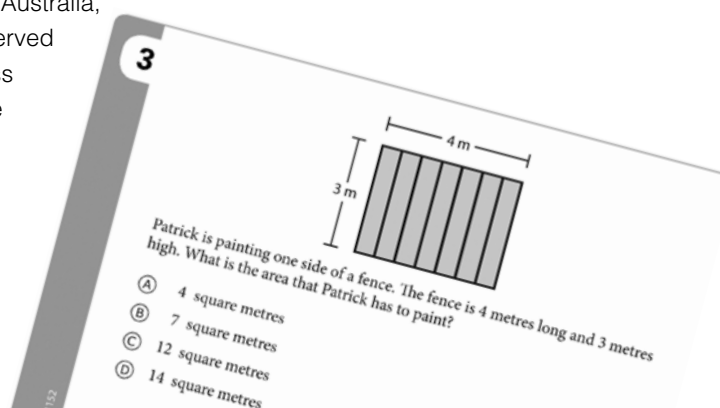
was an obvious gap between the understanding of Australian students and their Chinese-Taipei counterparts. Furthermore, where Australian and US students previously achieved at similar levels (see TIMSS 2003 results), the US outperformed Australia in almost all the items reviewed.

On the other hand, the international comparison made also illustrated the trap of simply considering average level results for a country. In three of the 10 items reviewed, Chinese-Taipei was outperformed by either the US or Australia. This finding does not diminish the high achievement levels of the Chinese-Taipei students who participated in TIMSS 2007 but emphasises that, while they were ranked in the top three for all grade/ curriculum areas, Chinese-Taipei students still demonstrated skill deficiencies in some areas.

The strengths and weaknesses of students' responses highlighted in this report were likely due to many different factors. However, with more awareness of students' understanding in different curriculum areas, educators can develop learning strategies that suit their particular teaching styles and unique educational contexts.

Further information can be found in *Informing mathematics pedagogy: TIMSS 07 Australia and the world* by Sue Thomson and Sarah Buckley, available from the TIMSS website at <www.acer.edu.au/timss> A CD is included with the report that contains all of the TIMSS 2007 released items so that teachers may see the types of questions students completed when they participated in the project.

Further information and all reports on all TIMSS assessments are available from the TIMSS website at <www.acer.edu.au/timss> ■



Australia to participate in PIRLS 2011



Australia will participate in the IEA Progress in International Reading Literacy Study, known as PIRLS, for the first time in 2011. ACER will lead Australia's participation in the project. PIRLS 2011 is the third

in a five-year cycle of assessment that measures trends in children's reading literacy achievement and policy and practices related to literacy. For the first time Australia will be able to compare reading literacy achievement of primary school aged children with other countries. Students in Grade 4 will take part. Australia's participation in PIRLS is being supported by the Commonwealth and State and Territory governments.

The collection of data for PIRLS 2011 will coincide with the 2011 administration of the Trends in International Mathematics and Science Study (TIMSS). Australian students taking part in TIMSS will also complete the assessments for PIRLS.

International and Australian national reports will be released in late 2012.

NSW National Partnerships Evaluation Committee

Dr John Ainley, ACER's Deputy CEO (Research) is to chair the New South Wales National Partnerships Evaluation Committee at the invitation of Education Minister Verity Firth. This new committee will provide expert advice regarding the strategic evaluation of significant educational reform in New South Wales, under the umbrella of the 'Smarter Schools' National Partnerships. The Committee will be comprised of a range of independent, NSW Government and non-government education sector representatives, and will provide high-level cross-sectoral oversight of the implementation of the evaluation framework in New South Wales.

Evaluation of Leading Australia's Schools program

ACER has been appointed by Teaching Australia to conduct an evaluation of the impact of Leading Australia's Schools participation on school effectiveness. Leading Australia's schools is a leadership program for principals across Australia. The project team will design the survey and conduct interviews with Leading Australia's Schools graduates from 2006, 2007 and 2008. The report will draw conclusions on the effectiveness of the program in meeting its objectives to enhance the skills, motivation and confidence of participating principals, to extend their capacity to make a real difference in student learning, and to plan and implement change and improvement within their own school. The project commenced in October 2009 and will conclude at the end of February 2010.

Research Conference 2009



This year's Research Conference took place in Perth from 16-18 August on the theme 'Assessment and Student Learning: Collecting, interpreting and using data to inform learning'. The conference explored issues in assessing and reporting student learning and in using assessment information to inform classroom practice and to monitor school and system performances. The conference was attended by 670 delegates from all Australian states and territories and New Zealand, Indonesia and Chile. Planning is underway for Research Conference 2010, 'Teaching Mathematics? Make it count: What research shows us about effective mathematics teaching and learning', to be held at the Crown Promenade Hotel, Melbourne, on 15-17 August 2010.

Masters joins expert working group

ACER's chief executive Professor Geoff Masters has accepted an invitation to become Deputy Chair of the Transforming Learning and the Transmission of Knowledge Expert Working Group of the Prime Minister's Science, Engineering and Innovation Council (PMSEIC). The PMSEIC was established in 1997 as the government's principal source of independent advice on issues in science, engineering and innovation and aspects of education and training. The council discusses major national issues in science, engineering and technology and their contribution to the economic and social development of Australia with discussion informed by expert working groups' independent reports focusing on areas of special interest to the government.

Recognising and rewarding teachers in Scotland

A recent paper by ACER Principal Research Fellow Dr Lawrence Ingvarson in *Professional Development in Education* reviews the Scottish Chartered Teacher Scheme in the light of international interest in policies designed to promote teacher quality.

The Scottish Chartered Teacher Scheme emerged in 2001, designed to recognise and reward teachers who attained high standards of practice. The scheme aimed to attract and retain effective teachers, and to ensure all teachers continue to engage in effective professional learning. Dr Ingvarson's paper was based on an address given to the National Chartered Teacher Conference in Edinburgh in June 2008. Full text copies of the article 'Developing and rewarding excellent teachers: The Scottish Chartered Teacher Scheme', *Professional Development in Education*, (35)3, September 2009 may be purchased online from Informaworld at <www.informaworld.com>

PISA 2009 testing complete

Testing for the 2009 cycle of the OECD Programme for International Student Assessment (PISA) took place in Australia between late July and early September. Approximately 18 500 students from 356 schools across Australia took part in PISA 2009. PISA assesses how far students near

the end of compulsory education (students are 15 years old when they participate in the assessments) have acquired some of the knowledge and skills that are essential for full participation in society. In all cycles, the domains of reading, mathematical and scientific literacy are covered not merely in terms of mastery of the school curriculum, but in terms of important knowledge and skills needed in adult life. In 2009 Reading Literacy is the major domain being assessed.

ACER is again conducting the Australian national component of PISA on behalf of the commonwealth, state and territory governments. ACER also leads a consortium of research and educational institutions and eminent individuals and holds the major contract to deliver the international PISA project on behalf of the Organisation for Economic Cooperation and Development (OECD). The results of PISA 2009 are due to be released in December 2010.

Schools First awards update

The first round of applications for Schools First closed in August and more than 1500 applications were received. ACER has been responsible for evaluating the applications. Schools could apply for an Impact Award, which recognises excellence in school-community partnerships, and/or a Seed Funding Award, which recognises the potential for excellence in these partnerships.

According to assessors, applications showed remarkable diversity in terms of the projects that have been set up. The stories were sometimes quite moving; many were inspirational; nearly all showed an excellent understanding of the important contribution that such partnerships can make to improving educational outcomes for students. The three partners – ACER, the Foundation for Young Australians and the National Australia Bank – are all heartened by the level of commitment shown by school communities to harnessing the expertise that exists in these communities. For more information visit <www.schoolsfirst.edu.au>



Master class in assessment

ACER hosted a Master Class in Assessment in Brisbane on 19 September. The Master Class was delivered by Dr Randy Bennett from Educational Testing Service in the US and Dr Yoav Cohen and Dr Anat Ben-Simon both from the National Institute for Testing and Evaluation in Israel. The three key focus areas of the Master Class were 'Marking practices with particular reference to multiple marking', 'Assessment of learning difficulties: diagnostic issues, provision of test accommodations and regulatory procedures' and 'Moving existing assessments to computer and using the computer to measure new things'.

Monitoring skills development

Tests of primary school students' higher-order thinking skills have been added to ACER's Monitoring Skills Development program. The Monitoring Skills Development (MSD) program is a series of tests intended to assess a range of general abilities, including verbal, quantitative, abstract reasoning and writing skills. The program now includes tests appropriate for students at middle primary school, the end of primary, at the start of secondary school and in middle secondary. For more information, visit <www.acer.edu.au/msd>

The future of higher degrees by research

A recent ACER report *Supply, Demand and Characteristics of the Higher Degree by Research Population in Australia* examines those in Australia who have a higher degree by research, with particular emphasis on involvement in the labour force and future levels of supply and demand.

The research found that in the past decade there has been notable growth in the number of completions of higher degree qualifications by research at Australian universities and, given recent policies relating to increasing support and funding for research in universities, that this growth could be expected to continue.

The research was conducted by ACER for the Department of Innovation, Industry, Science and Research in June 2009. The full report by Daniel Edwards, Ali Radloff and Hamish Coates can be accessed from the ACER Research Repository at <http://research.acer.edu.au/higher_education/10/>

PISA shows Indigenous students face substantial disadvantage

A summary of Indigenous students' results in international tests of reading, mathematical and scientific literacy suggests that initiatives to improve the education of Indigenous students have, to date, had little effect. According to *The achievement of Australia's Indigenous students in PISA 2000-2006* released by ACER in July, Indigenous students remain overrepresented at the lower levels and underrepresented at the upper levels of proficiency. The report brings together analyses of the achievement of Indigenous students in reading, mathematical and scientific literacy in each of the three cycles of the OECD Programme for International Student Assessment (PISA) conducted in 2000, 2003 and 2006.

The achievement of Australia's Indigenous students in PISA 2000-2006 by Lisa De Bortoli and Sue Thomson is available from the ACER Research Repository at <<http://research.acer.edu.au/ozpisa/6/>>

One Laptop Per Child evaluation

ACER is conducting an evaluation of the One Laptop Per Child (OLPC) program in three remote schools in Australia. The main purpose of the evaluation is to measure the impact of the OLPC program on improving student attendance and enhancing teaching and learning.

The evaluation is based on face-to-face interviews carried out during site visits to two schools, telephone interviews in the case of the third school, and regular email feedback from staff involved in the program. The site visits, interviews and email feedback so far suggest that these school communities are benefiting from their involvement in the OLPC program.

The main issues that have been identified during the course of the pilot program are teachers' lack of time to discover the potential of the laptops for teaching and learning, the need for additional training in some cases, and some technical issues that have needed to be addressed.

While care needs to be taken with any new program in terms of establishing a causal link between the intervention and improved student outcomes, the feedback so far from the three school communities involved in the OLPC pilot program has been very positive.

Research Conference

2010

Teaching Mathematics? Make it count

What research tells us about effective
mathematics teaching and learning

15-17 August 2010
Crown Promenade Hotel
Melbourne, Victoria

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ACER PRESS NEW RELEASES



The Progressive Achievement Tests in Science (PATScience) is an exciting new addition to ACER's best-selling suite of academic tests. It consists of a series of nationally normed tests to assess the level of achievement in scientific understanding for students in Years 3 to 10. The test questions are designed to assess science knowledge, scientific literacy and the understanding and application of scientific principles.

Specimen Set | \$169.95



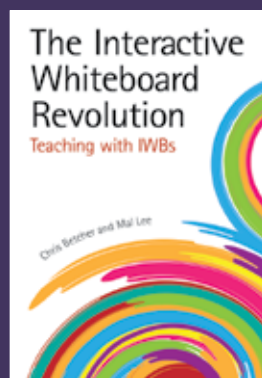
SPECTRA: Structured Program for Early Childhood Therapists working with Autism is a comprehensive intervention reference guide for psychologists, special needs teachers and therapists working with children with autism spectrum disorder. It provides a developmental framework as well as step-by-step instructions on how to implement a behaviour program to teach autistic children a comprehensive range of skills.

Dr Robyn Young, Carrie Partington & Talya Goren | \$249.95



Towards Parenthood: Preparing for the Changes and Challenges of a New Baby has grown out of the work of the Parent-Infant Research Institute (PIRI), a not-for-profit organisation dedicated to improving the emotional well-being of parents and infants. This guidebook aims to assist parents manage the complex demands of parenting.

Jeannette Milgrom, Jennifer Ericksen, Bronwyn Leigh, Yolanda Romeo, Elizabeth Loughlin, Rachael McCarthy & Bella Saunders | \$34.95



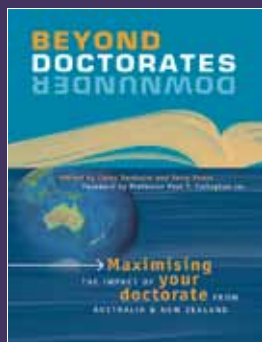
The Interactive Whiteboard Revolution: Teaching with IWBs provides a wealth of information on: getting your school started with IWBs; selecting the right IWB technology; principles and strategies for effective IWB teaching; lesson design and software tools; and professional development, training and support.

Chris Betcher & Mal Lee | \$34.95



What Teachers Need to Know About Students with Disabilities aims to provide practising teachers, teachers in training and other school personnel, up-to-date, factual information on a range of physical, intellectual, and social/emotional disabilities and the impact of each specific disability on an individual student's development and ability to learn.

Peter Westwood | \$34.95



Beyond Doctorates Downunder: Maximising the impact of your Doctorate from Australia and New Zealand is the third book in the highly successful Doctorates Downunder trilogy. This book is written for candidates in their final year of doctoral study and for doctoral graduates in their first five years after completion.

Carey Denholm & Terry Evans | \$49.95

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